**January 10, 2001**

# Surface Observation BUFR message format

Our goal is a flexible format that will encompass vertical upper air profiles regardless of the type of instrumentation used to measure them, enabling future data processing systems to operate with a minimum of software development.

Also, in order to avoid time delays encountered due to data organization, we propose a single station's measurements for a single time period in each individual message. Our single most heard complaint about current data delivery is that it isn't as timely as could be, especially for use in NWP.

Proposed BUFR definition for surface observations:

| ***Data Field*** | ***Element Name*** | ***Table B Descrip*** | ***Scale (10**n)*** | ***Reference (-n)*** | ***Width (Bits)*** | ***Units*** | ***Comments*** |
|---|---|---|---|---|---|---|---|
| 1 | WMO Block # | 0 01 001 | 0 | 0 | 7 | Numeric | (3 1 32) (3 1 1) MBM |
| 2 | WMO Station # | 0 01 002 | 0 | 0 | 10 | Numeric | (3 1 32)(3 1 1) MBM |
| 3 | Type of Station | 0 02 001 | 0 | 0 | 2 | Code Table | (3 1 32) 0 = automatic |
| 4 | Year | 0 04 001 | 0 | 0 | 12 | year | (3 1 32) (3 1 11) |
| 5 | Month | 0 04 002 | 0 | 0 | 4 | month | (3 1 32) (3 1 11) |
| 6 | Day | 0 04 003 | 0 | 0 | 6 | day | (3 1 32) (3 1 11) |
| 7 | Hour | 0 04 004 | 0 | 0 | 5 | hour | (3 1 32) (3 1 12) |
| 8 | Minute | 0 04 005 | 0 | 0 | 6 | minute | (3 1 32) (3 1 12) |
| 9 | Latitude (Low Accuracy) | 0 05 002 | 2 | -9000 | 15 | Degrees | (3 1 32)(3 1 24) |
| 10 | Longitude (Low Accuracy) | 0 06 002 | 2 | -18000 | 16 | Degrees | (3 1 32)(3 1 24) |
| 11 | Height of Station | 0 07 001 | 0 | -400 | 15 | m | (3 1 32)(3 1 24)Elevation AS |
| 12 | Type of measuring equip | 0 02 003 | 0 | 0 | 4 | Code Table | 6 = wind profiler |
| 13 | Time Significance | 0 08 021 | 0 | 0 | 5 | | 2 = Time Averaged |
| 14 | Averaging Time Period | 0 04 026 | 0 | -4096 | 13 | Seconds | -360 or -3600 for NPN (note |
| 15 | Wind Speed | 0 11 002 | 1 | 0 | 12 | $m.s^{-1}$ | |
| 16 | Wind Direction | 0 11 001 | 0 | 0 | 9 | Degrees true | |
| 17 | Pressure (MSL) | 0 10 051 | -1 | 0 | 14 | Pa | |
| 18 | Temperature | 0 12 001 | 1 | 0 | 12 | K | |
| 19 | Relative Humidity | 0 13 003 | 0 | 0 | 7 | % | |
| 20 | Rainfall Rate | 0 13 014 | 4 | 0 | 12 | $Kg.m^{-2}.s^{-1}$ | |
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Legend: MBM = May Be Missing, if station not permanent

Note 1: I believe this number should be negative to denote the fact we were averaging over the PREVIOUS n seconds.